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APRIL 1955

# FIREMEN

FIFTY-NINTH YEAR · NATIONAL FIRE PROTECTION ASSOCIATION

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## *Pennsylvania Opens New Fire School*

(See page 8)

**NFPA Annual Meeting – Cincinnati, Ohio – May 16-20**

*(See page 11)*

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Ward LaFrance apparatus will stand the fire test, working under the most severe conditions with never-failing reliability. This equipment is dependable because every step in construction is supervised by men who know lives and property are at stake when fire breaks out. These men take personal pride in seeing that the equipment they produce is the best that can be made. Rigid tests are made during construction of each Ward LaFrance chassis. Pumps are tested before and after installation. The complete equipment is then checked before as well as after delivery to the customer. These tests insure equipment that provides fire protection of the highest efficiency.

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**FEATURES**

- **Requires only 20% to 30% of space previously needed for complete central office equipment including batteries.**
- **Quickly and easily installed.**
- **Reserve power for emergencies.**
- **Available in any capacity required to 10 circuits. Readily expanded to meet growing needs.**
- **Automatically repeats box alarms; warns if a circuit is broken.**

Bulletin 3A gives a complete description of the Gamewell Form 4 Control Cabinet. Write for a copy today. No obligation.

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# 1954 ADT PERFORMANCE

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Supervisory signals, indicating conditions causing temporary impairment of sprinkler systems.....198,564
Waterflow alarms, caused by fires or serious leaks.....2,994
Manual fire alarms.....115
Reported values of properties protected.....$15,876,633,000
Ratio of losses to values protected.....2/100ths of 1%
Fire-loss immunity in 1954.....**99-98/100ths %**

AVERAGE FIRE-LOSS IMMUNITY DURING THE PAST TEN YEARS **99 98/100 %**

## BURGLAR AND HOLDUP ALARM SERVICES

Attacks on ADT Protection.....2,594
Entrances effected.....1,531
Captures as result of burglar, holdup, other emergency alarms....1,013
Reported values of properties protected.....$4,942,355,000*
Ratio of losses to values protected.....2/100ths of 1%
Burglary-loss immunity in 1954.....**99-98/100ths %**

*Not including ADT-protected values in bank vaults, the U.S. Treasury, Federal Reserve Banks and branches, the U.S. Mints and the U.S. Bullion Depositories at Fort Knox, Ky., and West Point, N. Y.

AVERAGE BURGLARY-LOSS IMMUNITY DURING THE PAST TEN YEARS **99 99/100 %**

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Investigations of failures of watchmen to signal Central Station on schedule.....206,875
Total number of signals recorded.....314,502,496
Watchmen's patrol efficiency.....99-93/100ths %
Alarms from Manual Fire Alarm Boxes.....1,362
Reported values of properties protected.....$18,907,278,000
Ratio of fire losses to values protected.....2/100ths of 1%
Fire-loss immunity in 1954.....**99-98/100ths %**

AVERAGE FIRE-LOSS IMMUNITY DURING THE PAST TEN YEARS **99 96/100 %**

This remarkable record reflects the value of continuous supervision and proper maintenance of protective signaling systems, as provided by ADT Services. For complete information, call our local sales office if we are listed in your phone book, or write to our Executive Offices.

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THIS NEW BULLETIN— shows *point-by-point* the reasons why a powerful, precision-built, gear-driven UA Pump costs less to build and install on any chassis you select. It shows how you can fight fires while the truck is moving — with high-pressure straight streams or famous Barton Super-Fog Guns.

IT SHOWS HOW you can carry more water or equipment—on a chassis that's better balanced for the road—than with other pumps. And it gives details on our exclusive Service-Pump Plan—an extra assurance that your community will *always* have continuous fire protection! There are many other points to consider, so—

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Milwaukee puts into service this Mack Type 85 tractor-drawn 85-ft. aerial. Special rear wheel sanders. Powered by famous Mack 707 Thermodyne® engine and equipped with the smoothest and safest aerial ladder in use today. It's the thirteenth Mack delivered to Milwaukee in recent years.

# Milwaukee gets modern aerial ladder maneuverability meeting modern municipal conditions

Modern municipal street and traffic conditions call for fire apparatus that's designed throughout for utmost maneuverability. The Mack Type 85 six-wheel tractor-drawn 85′ aerial ladder is an outstanding example.

Product of the industry's most experienced manufacturer of quality tractors, this Mack has been described as the sweetest-handling tractor-drawn aerial going. Compact design . . . sure-footed balance . . . high power-to-weight ratio—all contribute to the remarkable performance of this unit.

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3034

# Firemen

Volume 22 — Number 4

WARREN Y. KIMBALL — EDITOR
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**NATIONAL FIRE PROTECTION ASSOCIATION**

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**Contents for April 1955**


| | Page |
|---|---|
| Pennsylvania Opens New Fire School | 8 |
| NFPA Annual Meeting | 11 |
| Flammable Liquids Notebook | 12 |
| Fires in the News | 13 |
| Small Force-Fast Attack in Santa Barbara, Fire Department, by Boris Laiming | 14 |
| Highlights of the 27th FDIC | 16 |
| New Jersey Training | 17 |
| Maryland Fire Service Benefit Show | 17 |
| Things to Consider in Aircraft Crash Fires | 18 |
| Using 1½-in. Lines to Maximum Capacity | 21 |
| Experimental Fires | 22 |
| Garden for Firemen | 23 |
| Going to a Fire School? | 24 |
| Instruction Manual | 26 |
| Louisiana Arson School | 26 |
| Making a Good Job of It, by Warren Y. Kimball | 30 |
| Membership Report | 32 |
| What's New in Fire Equipment, Catalogs, and Bulletins? | 34 |
| Index to Advertisers | 34 |


**Cover Picture**

The opening of the vast new Pennsylvania Fire School in Lewistown this month marks another major step in the development of firemen's training. (See pages 8 to 10.) The fire training building at this site has structural features of a number of types of occupancies and incorporates ideas suggested for such installations in the November, 1945 issue of FIREMEN, when the New Haven Fire School was first being planned.

Pennsylvania, West Virginia, Maryland, Florida and Connecticut now feature well-equipped and designed State training centers where paid and volunteer fire fighters can learn the latest techniques in fire control and extinguishment. Other States are considering construction of similar centers.

While most fire fighters participate in basic training, few fire departments can afford such facilities as those which can be provided at a State level. A well-rounded firemen's training program demands special facilities and instructional aids for advanced training courses. However, new training centers are not solely a product of state-sponsored programs.

Last October FIREMEN magazine featured a story on Baltimore County's (Maryland) excellent facilities. In the November issue there was an article on the Fire and Police Academy in Rochester, New York, which is serving the City of Rochester and Monroe County. And the December issue mentioned that the cities of Boston, Massachusetts, and Buffalo, New York, were planning extensive training facilities for their fire departments.

The construction of such facilities is not haphazard. Each new training center represents many years of hoping, planning, worrying and just plain work. Thanks to the spirit of kinship that exists in the fire service, those responsible for planning and developing training centers can get a lot of valuable information and advice from fire chiefs and other authorities who have wrestled with such problems in the past. When the Pennsylvania Fire School was being planned, suggestions were sought from the NFPA Committee on Firemen's Training, the NFPA Staff, from the officers of the New Haven, Connecticut, Fire Department who gained so much experience in building the facilities for that training center, and other persons who were familiar with the difficulties and benefits of building adequate firemen's training schools.

If the trend of past years continues, this year will witness another record number of fire fighters participating in training at State, County and local training centers. There will, perhaps, be a growing pressure for more and more modern facilities where up-to-date training aids and instructional methods will help fire fighters learn more quickly the latest techniques of fire control.

The "drill school season" starts this month and will continue through the Fall. On pages 24 and 25 of this issue some of the State fire schools are announced, together with the names of the directors who can furnish information on subjects to be taught, room and board facilities, and other details. This column will be continued in FIREMEN until the fire school season ends.

**False Alarm Penalty**

A Brooklyn youth recently was sentenced to a year in the penetentiary for sounding a malicious false alarm of fire. According to the New York *Times*, this was the most severe jail term ever imposed for the offense in New York City. In September, 1954, a change in the New York Administrative Code increased the false-alarm punishment from a maximum of thirty days to one year, while the maximum fine was increased from $100 to $1,000. The change occurred shortly after three fire fighters were killed and eleven injured in collisions which happened during response to false alarms. (See FIREMEN for September and October, 1954).

The seriousness of the false alarm problem in New York City has been stressed by Fire Commissioner Edward F. Cavanaugh who recently pointed out that in 1954 there were 12,427 malicious false alarms turned in in that city, resulting in an unnecessary expense of approximately $900,000.

# Pennsylvania Opens New Fire School

THE opening of the new Pennsylvania Fire School at Lewistown this month deserves country-wide attention from the fire service. The $750,000 training center is the result of nearly six years of careful planning and construction and incorporates the latest design of instructional facilities. Dedication ceremonies are scheduled for Saturday, April 30. Pennsylvania's Governor George M. Leader is expected to make the feature address, which will be followed by an "open house" and other colorful ceremonies.

Administration building houses executive offices, classrooms, laboratories, maintenance shop, and a fire station.

### Fire Training Building

Perhaps the most important structure at the training center is the building designated for structural fire fighting activities. This is a 1-, 2-, 4- and 5-story concrete block building divided into sections to duplicate a manufacturing plant, a mercantile occupancy, a dwelling and a general utility building. Each section has general construction characteristics of buildings of the types represented, including appropriate doors and windows and typical internal fire hazards, such as a spray booth and dip tank in the manufacturing section, an oil burner in the basement of the dwelling structure, open and enclosed stairways, and elevator shafts.

The building is constructed of fire resistive materials. Walls, floors, roofs, and protective covering of metal structural members are made of special concrete designed to withstand 2600 degree Fahrenheit temperature. Fire doors of different types are installed to cut off sections of the building. All floors and roofs have openings which are filled with combustible flooring and roofing so that fire can spread from room to room and upwards through the various floor levels. This arrangement will also permit fire fighters to become used to proper ventilation procedures.

A hollow wall constructed of fire brick, with combustible inserts, will allow training in "partition" fires. All windows are hinged at the top to allow automatic ventilation if explosions should occur.

The general utility section of this building is protected by an automatic sprinkler system, water for which is supplied through a system of manifolds which permit operation of a wet system, a dry-pipe system, or a deluge system through the same sprinkler piping. An open sprinkler system protects the basement and outside sprinklers are also provided at windows on one side of the building.

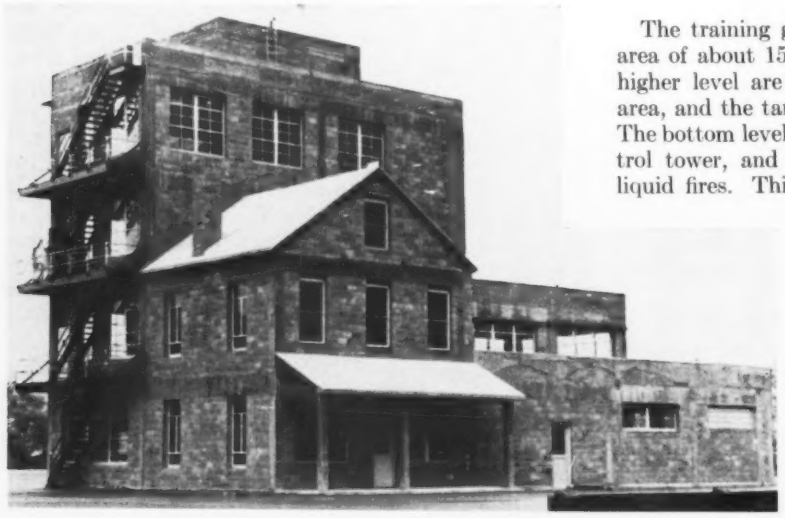
A standpipe is installed with connections at each story, the basement and the roof. Fire department connections are provided for the standpipe and all sprinkler systems.

The 4-story manufacturing plant section features a modern smoke-proof tower-type fire escape which also will be used as a drill tower. There is also an outside steel fire escape. Thermocouples will be used throughout the fire training building to permit recording of temperature changes during fire fighting.

Possibly the only type of normal fire problem which was not incorporated into the original design of this building was that of a fire above a ceiling, necessitating the use of plaster hooks. This condition, however, has been corrected.

### Training Grounds

The training grounds at Lewistown spread over an area of about 15 acres. There are two levels. On the higher level are the administration building, parking area, and the tank for drafting operations (see photo). The bottom level features the fire training building, control tower, and seven pits for conducting flammable liquid fires. This lower area is approximately 500 ft.



*(Left)* Fire training building allows training in a variety of fire fighting conditions. Each section of the building is designed to duplicate a particular type of occupancy. For example, the front section of this picture is a 2½-story dwelling structure; wing at right duplicates a mercantile occupancy; another represents a factory.

long and 200 ft. wide, and permits a number of simultaneous operations, including maneuvering of apparatus.

Water is supplied to the drill grounds through a 10-in. main connected to the local reservoir. From this a 6-in. main supplies the 50,000-gallon drafting pit, which in turn supplies the pump station in the lower yard, where a 1200 gpm electrically operated centrifugal pump supplies four different types of hydrants in the yard system. Water used in the training building, pump laboratory and drafting pit can be recirculated through a separate system from that which supplies showers and drinking fountains.

Both yard levels are surfaced with 2 in. of bituminous mixture on top of 6 inches of native stone. Fencing consists of 4- x 10-in. planks fastened to 6- x 8-in. posts. The entire training area is terraced and landscaped attractively.

### Control Tower

"Nerve center" of the drill grounds is the control tower, centrally located in the bottom yard. Here electrical switches permit delivery of gasoline, fuel oil, or compressed air to any floor of the fire training building, or to any pit in the drill yard. From this building an instructor can turn off water supply to each individual hydrant, or control the supply to the sprinkler and standpipe systems.

Weather equipment is installed to indicate direction and velocity of the wind, temperature and relative humidity. An adequate public address system for the entire drill yard is also controlled from this building. A telephone installation allows communications with the administration building. The thermocouples in the fire training building are connected to a potentiometer in the control center, presenting the operator with instant information of temperature in any area of the fire training building.

Outside of this building is a municipal fire alarm box connected to the alarm system at the watch desk in the administration building.

### Administration Building

This 81- x 95-ft. 2-story brick structure houses the administrative offices for the staff, laboratories, the fire station and apparatus room, a library, locker room, shower room, classrooms and a maintenance shop. Two of the classrooms can be combined into one large hall by moving an accordion partition. The hall has a built-in public address system.

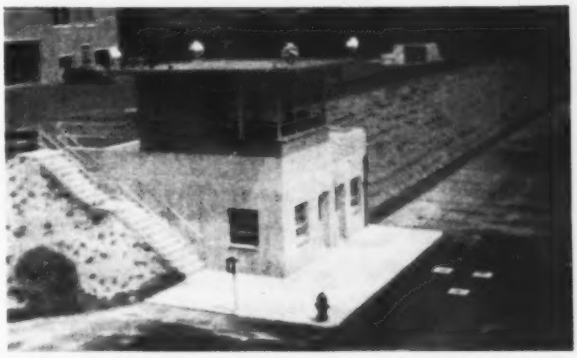
Modern photographic equipment, including a motion picture projector, reflex type projectors for both transparent and opaque materials, a stereotype projector, cameras, and dark room materials are also provided.

There is a science laboratory equipped with a large desk for demonstrations, which has hoods and connections for water, gas, compressed air, and 110/220 volt electricity. Other equipment is provided for instruction in physics and chemistry pertaining to fire, heat and hydraulics.

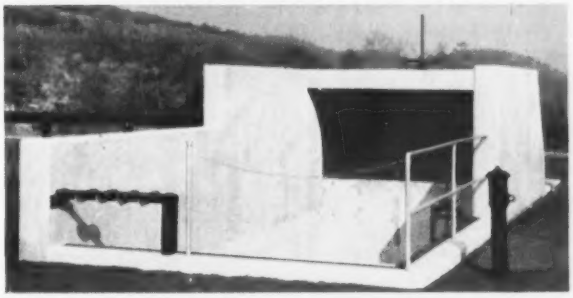
The pump laboratory features a fire apparatus engine and 750 gpm pump, mounted in a stationary position. (See illustration.) Adjacent to this room is the pump

The fire training building features numerous types of windows arranged in the rooms to duplicate structural conditions which would be encountered by fire fighters. All windows are hinged at the top so that they will swing outward if explosion occurs. Ed Spotz is shown here at one such installation. Note thermocouple attached to permanent receptacle at bottom.

Three of the pits for flammable liquid fires as seen from the fire training building. Circular tank in foreground is 30 ft. in diameter; next is 15 ft. in diameter; rear pit is 40 x 20 ft. There are two other 20 x 10 ft. pits and two pits each 10 ft. square.



Control tower allows supervision and control of operations in the entire drill area. Electrical switches permit supply and ignition of flammable liquids to any of the pits in the yard or the rooms in the fire training building.



This drafting pit is located in the upper drill yard. It has a capacity of 50,000 gallons and is designed to present a variety of drafting problems for pump operators.

classroom containing a "cutaway" 750 gpm pump model which can be operated electrically. This model is also supplied by compressed air to permit slow operation and observation of the changeover valve and other parts. With this and other training aids, students will progress in instruction from the model to the stationary mounted pump and then to actual operation of a 750 gpm pumper in the yard. The model, stationary mounted pump and pumper are all identical Seagrave pumps of 750 gpm capacity.

The maintenance shop contains power tools for manufacturing combustible inserts used in the training building, and for other essential materials. Complete facilities are also in this room for recharging fire extinguishers and for cleaning, drying and storing fire hose.

The fire station in the west side of the building houses a 750 gpm Seagrave pumper and a 100-ft. Seagrave aerial ladder truck, both owned by the School. There is also a complete watch desk and a short-wave radio.

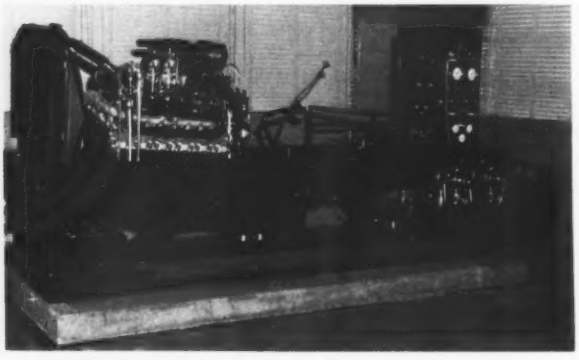
### History of Development

Annual fire schools have been conducted since 1939 by the Public Service Institute of the Pennsylvania Department of Public Instruction. Starting in 1946, these one-week schools featured training under actual fire conditions with improvised facilities. At present there are more than 2,000 fire departments in the State, mostly volunteer, and, through the years, upwards of 6,000 or 7,000 fire fighters participating in the Fire Service Training courses emphasized the need of a State training center.

In 1949 a non-partisan bill was introduced to the Pennsylvania State Legislature calling for the establishment of modern facilities for training firemen. The bill was sponsored by State Senators George Wade and Frank Ruth, and House Representative Harry Price of the Lewistown District. Act No. 547 was passed in the 1949 session authorizing establishment of the school at Lewistown. Funds were made available from the General State Authority which allocates monies for such capital improvement projects with a 30-year repayment provision.

Actual planning was done by the Fire School Advisory Committee and Edgar A. Spotz, Adviser in Fire Service Training of the Public Service Institute (member NFPA Committee on Firemen's Training). Members of the Advisory Committee are Michael E. Clark, retired Chief of the Williamsport Fire Department; Assistant Chief Frank Deen of the Lancaster Fire Department; Chief L. Ellis Wagner of the York Fire Department; A. Nelson Yearick, retired Chief of the Lewistown Fire Department; Charles E. Clark, Executive Secretary of the Firemen's Association of Pennsylvania; Hugh G. Pyle of Pennsylvania State University; State Fire Marshal Captain William F. Traeger; and Chief Ross Blodgett of the Alleghany County Institution District Fire Department near Pittsburgh. Warren Y. Kimball, Manager, Fire Services Dept., NFPA, assisted with the early stages of planning.

Dr. Francis B. Haas, Superintendent of Public Instruction, Dr. Ralph C. Swan, Acting Superintendent of Public Instruction, and Principal Alfred S. Holt of The Public Service Institute, supervised the planning.



**The pump laboratory features this fire apparatus engine and 750 gpm pump, mounted in a stationary position, an underground suction connection to the outside drafting pit and gates for supplying water to the drill yard. Installation of at least one more pump is planned for this room, which is adjacent to a classroom which features pump cutouts, blackboards and other training aids for instruction in hydraulics.**

**One of the assembly rooms in the administration building. There are three rooms altogether, two of which are separated by the movable accordion partition shown in this photo. The partitions are easily operated so that the two rooms may be changed quickly into one large auditorium.**

### Scheduled Training

Starting this year the Pennsylvania Fire School will operate continuously throughout the summer months. Courses scheduled will cover standard fire fighting, advanced fire fighting, fire apparatus operation and maintenance, fire service instruction (with W. Fred Heisler of Oklahoma A & M as chief instructor), and an annual fire school round-up consisting of lectures, round table discussions and demonstrations. Here are the dates of the scheduled classes for 1955:

| | |
|---|---|
| June 20–24 | Standard Fire Fighting Course |
| July 11–15 | Advanced Fire Fighting Course |
| August 1–5 | Annual Fire School Round-up |
| August 8–12 | Fire Service Instruction Course |
| August 22–26 | Fire Apparatus Operation and Maintenance Course |
| September 12–16 | Standard Fire Fighting Course |
| September 26–30 | Advanced Fire Fighting Course |
| October 10–14 | Fire Apparatus Operation and Maintenance Course |
| October 17–21 | Standard Fire Fighting Course |
| October 24–28 | Advanced Fire Fighting Course |

*Cincinnati — Host City to the*

# *59th NFPA Annual Meeting*

CINCINNATI, OHIO, will be host city to the 59th NFPA Annual Meeting during the week of May 16–20. Headquarters for the meeting will be the Netherland Plaza Hotel, but accommodations for NFPA members and guests have also been set aside at the Sinton and Sheraton-Gibson Hotels.

Firemen in uniform may attend any of the open sessions of the meeting without paying a registration fee. The program will contain a number of features which should be of particular interest to fire fighters. The box at upper right shows in general what the five days will present. A more detailed program, listing the speakers and topics of each session, will appear in the April issue of NFPA *Fire News*.

Many fire fighters will want to attend the FIRE MARSHALS' SECTION on Monday. While this session is planned to suit the interests of state, provincial and municipal fire marshals, it always includes lively discussions of topics of direct concern to fire departments. This year, subjects to be covered include flammable liquids, liquefied petroleum gases, civil defense, and fire law enforcement.

The AVIATION SEMINAR on Monday will consider a variety of aviation fire problems including aircraft crash rescue, crash resistance of fuel tanks, and fueling operations. Battalion Chief Alfred M. Grunwell of the Washington, D. C., Fire Department will report on tests which his sub-committee conducted to determine the proper use and effect of 1½-in. hose streams and other municipal fire department equipment on aircraft crash fires.

### Tentative Program for 59th NFPA Annual Meeting

**Sunday, May 15**
Registration — 2:00 P.M. to 6:00 P.M.

**Monday, May 16**
Registration — 9:00 A.M.
Fire Marshals' Section — 10:00 A.M. and 2:15 P.M.
Electrical Section — 10:00 A.M. and 2:15 P.M.
Aviation Seminar — 10:00 A.M. and 2:15 P.M.
Get-Acquainted Party — 5:00 to 7:00 P.M.

**Tuesday, May 17**
General Session — All day
Fire Marshals' Section — 2:15 P.M.
Evening — Group parties are contemplated for Cincinnati Reds–Pittsburgh Pirates baseball game and Cinerama movie.

**Wednesday, May 18**
Fire Detection & Extinguishment — 9:30 A.M. and 2:15 P.M.
Hazardous Materials — 9:30 A.M.
Visual Aids to Fire Prevention — 2:15 P.M.
Motion Picture Show — Fire Subjects — 8:15 P.M.

**Thursday, May 19**
Fire and Life Safety in Buildings — 9:30 A.M.
Municipal and Rural Fire Protection — 2:15 P.M.
Industrial Fire Protection — 9:30 A.M. and 2:15 P.M.
Society of Fire Protection Engineers — 8:15 P.M.

**Friday, May 20**
Final Session — 9:30 A.M.

On Wednesday afternoon a session will be devoted to methods of presenting fire prevention programs through radio, television and motion pictures. There will be a panel discussion featuring representatives of radio and TV stations which have won awards for fire prevention activities. Another speaker will describe how to prepare motion pictures for firemen's training and for educating the public in fire prevention. The closing address will be on the subject of organizing material and using personnel in making such films.

On Thursday, one afternoon session will present reports, discussion and addresses on municipal fire apparatus, fire hose developments, fire department administration, current fire service problems, and forest fire prevention. Speakers will include C. Gray Burnett, President of the International Association of Fire Chiefs; Chief C. L. Bolz, Instructor in Fire Administration at the University of Southern California, who will talk on "university level" training for the fire service; and Warren Y. Kimball, Manager, NFPA Fire Services Department, who will discuss the redevelopment program of the Boston, Massachusetts, Fire Department.

Many NFPA members and guests may be interested in looking over the Cincinnati Fire Department headed by Chief Barney J. Houston who has been an NFPA member since 1943. He has been Chief of the Department since 1916 and has 48 years of active service. The Department celebrated its 100th anniversary on April 1, 1953, and in recent years has acquired an attractive new headquarters building. An interesting standard procedure is that members make detailed drawings of the major fires in which they participate. (See FIREMEN for April, 1951.) The drawings are then used for post-fire critiques and for subsequent training. Cincinnati also boasts a well-equipped rescue truck which has a complete set of air-operated power tools.

Built in 1950, this station serves as headquarters for the Cincinnati Fire Department. It is located at 9th Avenue and Broadway.

# *Flammable Liquids Notebook*

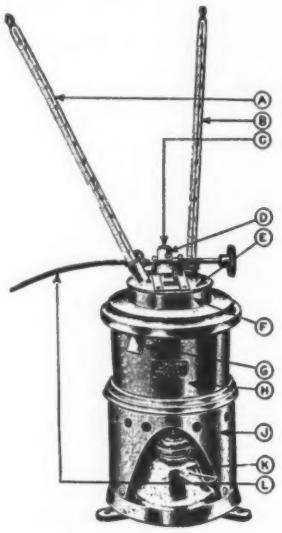
**Part I of a series which can be used in training fire fighters in the properties and hazards of flammable liquids and recommended techniques for fighting fires involving flammable liquids.**

SOME of the most spectacular and difficult fire control problems occur when large quantities of flammable liquids are involved. Intense heat, a variety of shapes and sizes of tanks and other containers, and the threat of spills, "boil-overs," or similar eruptions are apt to confront the men who have to cope with such fires. FIREMEN magazine begins this series with the cooperation of Miles E. Woodworth, NFPA Flammable Liquids Engineer, to emphasize those fundamentals which will afford the greatest protection and success to fire fighters and fire departments who have to control and extinguish flammable liquid fires.

Much helpful information may be found in the NFPA Handbook of Fire Protection ($10.50 per copy) which summarizes principle extinguishing methods and describes the general effect of extinguishing agents on flammable liquids, gases and volatile solids. It also contains a comprehensive table which identifies flash points, ignition temperature, explosive limits and other important properties of these substances.

Another good source of reference is NFPA Standard No. 30L — "Flammable Liquids Ordinance." Here may be found the official recommendations of NFPA for municipal regulation of the storage and handling of gasoline and other flammable liquids in the interest of public safety. Generally, as this standard indicates, fire departments are the enforcing authorities of flammable liquids ordinances. Chiefs and fire fighters should, therefore, be familiar with the provisions of "30L" in order to be able to identify proper storage conditions, tank structures, venting methods, and other factors concerning these installations. (This standard is available as a separate pamphlet, (50 cents per copy) and is also included in Volume I "Flammable Liquids and Gases" of the National Fire Codes, $6.00 per copy.)

There is also NFPA No. 325A — "Flammable Liquids Trade Name Index," which lists the trade names, flash points, principal uses, and manufacturers of more than 2,400 commercial flammable liquid products. (Price $1.25 per copy.)




**Tag Closed Tester**

**(A) Flash point thermometer; (B) water bath thermometer; (C) oil chamber; (D) burner tip; (E) cover; (F) cup; (G) overflow spout; (H) water bath; (J) chamber; (K) heating lamp; (L) gas tube. (*Illustration from Tag Manual for Inspectors of Petroleum.*)**

At present there are thirty-three states and hundreds of cities which have regulations on flammable liquids, most of which use the NFPA standards as a basis. Unfortunately, many of these regulations have not been kept up to date. In fact, a few states still are using flammable liquid regulations dating back as far as 1921. It is obvious that a great deal has changed in the manufacture, types, and use of flammable liquids even since World War II.

One has only to look at the recent extensive growth of the chemical industry and the widespread entrance of the oil industry into the petrochemical field to realize the increasing problems in the field of flammable liquids. Not only have new flammable liquids been developed, such as jet fuels, but also there has been a greater use made of other flammable liquids. Many liquids which were formerly used in laboratories or in only a few sections of the country are now being very widely used and manufactured. As a result, new problems are developing for many fire departments both in the prevention and fire fighting field.

FLASH POINT. All flammable or combustible liquids are normally judged as to their fire hazard by their flash point. Although flash point is not the only factor which must be considered in evaluating the fire hazard of a flammable liquid, it is the most widely accepted and used basis for classification.

Flash point simply means that under test conditions it is the lowest temperature at which sufficient vapors escape at the surface of the liquid to flash when an ignition source is applied. The NFPA and the American Standards Association use the Tag (Tagliabue) Closed Tester for a determination of the flash point of materials below 175 degrees F. For testing of liquids above 175 degrees F. the Pensky-Martens Closed Tester is used.

Many manufacturers, trade publications, the Interstate Commerce Commission and the U. S. Coast Guard use the "open cup" flash point. This is determined by testing the specimen in an open cup. Because some vapor escapes during the test the flash point occurring in the "open cup" test is usually a few to fifty or more degrees higher than the "closed cup" figure.

For example, acetone, having a "closed cup" flash point of 0 degrees F., has an "open cup" flash point of 15 degrees F.; whereas a quench oil, with a "closed cup" flash point of 365 degrees F. may have an "open cup" flash point test of 405 degrees F. Very generally speaking, for most flammable liquids, the ICC division at 80 degrees F. (open cup) for red label requirements, compares reasonably well with the NFPA division between Class II and Class III flammable liquids at 70 degrees F. (closed cup). Since it is often desirable to test for flash points of unknown liquids, many fire departments are equipped with a Tag Closed Cup Tester.

# FIRES in the News

**Red Wing, Minnesota, March 7.** (*Wide World Photo.*) Tire paint was ignited in this 3-story brick and wood frame structure used as a tire recapping and distributing plant. Dust from tire buffing, tire cementing compound, and a wooden elevator shaft contributed to flame spread. Fire was coming through the roof within five minutes and estimated loss totalled $225,000 despite efforts of fire fighters from 3 engine companies and a ladder company who responded to a telephone alarm.

(*Upper right*) **Manchester, New Hampshire, March 2.** (*United Press Photo.*) A 3-story business block containing 10 stores and business offices received damage estimated at more than $500,000. More than 125 fire fighters from both platoons of 12 Manchester fire companies took part in the battle. Only one alarm was sounded as Fire Chief G. N. Guevin decided that it was better to summon individual engines for particular spotting at the fire scene.

**Milwaukee, Wisconsin, February 21.** (*United Press Photo.*) Fire starting in the boiler room of this 2-story brick, wood joisted appliance store spread rapidly along open raceway for electrical wiring, then into a false ceiling. Open stairs and lack of fire walls allowed spread throughout both floors. High winds helped to make an estimated loss of $200,000. Nine fire fighters were injured.

**Minneapolis, Minnesota, February 14.** (*United Press Photo.*) While some 20 tons of hexane ladened meal were being transferred in this linseed oil mill, a spark caused an explosion in the extractor. An automatic sprinkler system held fire under control while Minneapolis and Columbia Heights fire fighters using small lines with fog nozzles rescued 14 injured workmen, two of whom died later. Sheet metal panels with clip fasteners helped dissipate force of intermittent explosions.

**Boston, Massachusetts, March 14.** (*Associated Press Wirephoto.*) A 4-alarm response to fire in this 4-story brick furniture store included use of this high pressure wagon. Note 3-in. lines supplying "JN 200" nozzle at left and high pressure gun at right. Assistant Chief Edward N. Montgomery appears in foreground.

**Boston, Massachusetts, March 3.** (*Wide World Photo.*) Despite heavy involvement of oil-soaked substructure and three 1-story wooden warehouses, fire fighters used big fog guns to stop spread in the section of pier at upper center. The 5-alarm response included two Boston fire boats, a Navy tug, and Coast Guard craft.

*Small Force — Fast Attack in*

# Santa Barbara Fire Department

**A report on operational procedures in Santa Barbara, California, Fire Department by Boris Laiming.***

THE Santa Barbara, California, Fire Department, under Chief C. L. Tenney, is outstanding for its modern operating methods and excellent apparatus. Through foresight in planning the construction of its new apparatus, and in developing procedures, the Santa Barbara Fire Department has achieved efficient operation in spite of serious manpower deficiency which is subject to penalty under the NBFU grading schedule, resulting in lower grading of the Fire Department. The Department does a splendid job of keeping its fires small, as demonstrated in the records for several years, mainly due to the methods it has adopted to secure prompt and effective attack of fires by means of modern combination apparatus with large capacity water tanks, pre-connected hose lines and fog nozzles.

Santa Barbara is, predominantly, a residential city of 50,000 population, covering an area of 19½ square miles. A large part of this area consists of hills or mountainous terrain with steep grades, narrow winding streets and residential or public properties situated on hillsides between areas of forest or brush land which are characteristically tinder-dry during long summer and fall seasons. Industrial buildings, fish processing plants in the harbor, lumber yards and large public buildings complete the list of what there is to burn in Santa Barbara.

The Fire Department consists of 76 full paid members, including the Chief, 2 Assistant Chiefs, 1 Fire Marshal (in charge of fire prevention), 2 Fire Prevention Inspectors, 1 Master Mechanic and 1 Radio Technician. Fire fighting personnel operate on a "24 hours on-24 off" basis, with an individual working time schedule of 72 hours per week. There are 7 fire stations in which 9 units, or companies, are in service, including 7 engines, 1 squad and 1 aerial truck, operated by only 28 men actually on duty. All units and fire department cars are equipped with 3-way radio on a frequency of 154.19 MC.

Apparatus in service consists of the following pieces: 1 FWD (1951) 750 gallon tanker with a 600 gpm pump; 2 FWD (1950) 750 gpm triple combination pumpers with 400 gallon water tanks; 3 Mack (1943–1948) 750 gpm "triples" with 400 gallon tanks; 1 GMC (1953) 1000 gpm triple with 500 gallon tanks; 1 General (1938) 750 gpm triple with a 200 gallon tank; 1 Mack (1944) squad; 1 Mack (1944) tractorized 65-foot aerial truck, and 1 Chevrolet (1942) hose wagon which carries 1,200 feet of 3½-in. hose with a manifold and 2 portable Morse monitors.

In addition, 3 triple combination pumpers and 1 tanker are in reserve, loaded and available for relief, standby or training purposes. All triples in service have two reels of 250 feet of ¾-in. booster line, carry preconnected 1½-in. lines and have divided hose bodies. The Department is completely equipped with combination fog-straight stream nozzles from booster to monitor size, which were first introduced 15 years ago.

A rather unusual and versatile piece of apparatus is the FWD Tanker in service at Engine Co. 1 (Figure 1). It was designed and built by the Santa Barbara Fire Department on a four-wheel drive chassis with a 275 hp Hall Scott motor and a high pressure 3-stage Waterous 600 gpm pump. This apparatus weighs about 30,000 pounds and combines the features of a regular triple combination pumper, a forestry type tanker of 750 gallons capacity, a high pressure fog unit and certain elements of a squad unit.

The second due engine company backs this unit with a 2½-in. supply line to the tank and its crew will take additional pre-connected 1½-in. lines to the fire from the first unit. With this hose arrangement on the apparatus, it is possible to place in operation up to four lines of 1½-in. hose with combination fog nozzles very quickly, using a crew of only 6 men from the first two pieces of pumper apparatus responding.

An interesting feature of the 750 gallon tank apparatus is the monitor nozzle mounted at the rear. Experience has shown that some fast-spreading brush fires in mountainous areas can be effectively fought with the aid of this monitor supplied from the tank. When op-

**(Left) The tanker of Engine Company 1 carries a Homelite generator, a smoke ejector, a 250 gpm Homelite portable pump, a 35-ft. aluminum extension ladder, and a 600 gpm Morse monitor with a 500 gpm "Jumbo Mystery" fog nozzle at the rear of the apparatus. This monitor is connected directly to the main pump which can take suction from the 750-gallon tank.**

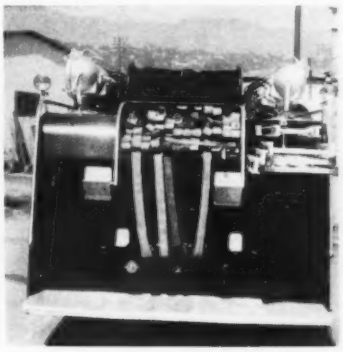
*Mr. Boris Laiming is a petroleum geologist by profession, but for many years has been an observer of fire protection matters. He was a government consultant on World War II fires. He wrote an eyewitness account of the great Tokyo, Japan, conflagration of 1923 and has contributed papers on European fire departments, wartime fires and other subjects to the NFPA Quarterly and FIREMEN magazine, and to other periodicals.

(*Right*) Santa Barbara fire fighters sometimes have to cope with this type of terrain. The monitor provides good reach and a good supply of water to hold an advancing brush fire.

erated from a hillside road, the long reach of the monitor stream makes it possible to hold the head of an advancing brush fire just long enough for hand lines from other tanks to be advanced to proper positions, even though the 750 gallon tank supply lasts only 1½ to 2 minutes of monitor operation. Where hydrants are available on mountain roads, the tank supply can, of course, be replenished for continuous operation of the monitor or 1½-in. hand lines. This method of using tank apparatus was developed in Santa Barbara for more effective control of brush fires in areas where numerous structures are located on brush covered hillsides.

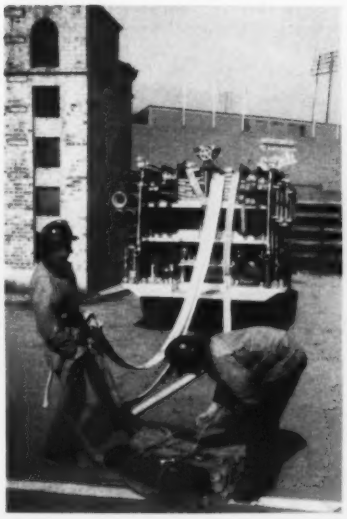
Another practical unit used by the Santa Barbara Fire Department to save manpower and time is the combination hose carrier and manifold wagon built on a Chevrolet 1½-ton chassis. This unit carries 1200 feet of 3½-in. hose in a divided hose body. The two lines are wyed together and the wye can be attached directly to high pressure large capacity hydrants available in certain areas of the city. If necessary, this wye can be removed so that the lines can be connected to pumper discharge gates, proper fittings for this being provided on the tail board of the hose wagon.

The methods and equipment described here are not a substitute for manpower, but they have enabled a fire department running with only 3 men per company to make the most of what they have. More adequately manned fire departments may make use of these methods to even greater advantage to assure speed of operation and better results in fighting fire.



(*Left*) Rear view of squad unit. Note preconnected lines and arrangement of hose load in divided body.

Side view of squad unit, showing compartments for equipment. This truck also has four preconnected 1½-in. lines.



(*Right*) Two lines of 1½-in. hose wyed to 2½-in. line allow quick laying of line. Loop held by man at left provides slack before pumper or tanker moves to hydrant. This lay is generally used at larger fires. The 1½-in. hose is carried in compartment above tail board. Two men remove the bundle preparatory to laying 2½-in line.

Hose bed is divided into six compartments. Four carry the preconnected 1½-in. lines, 150 ft. or 300 ft. long, one of which is shown being laid.

# Highlights of the 27th FDIC

THE Memphis, Tennessee, Fire Department, headed by Chief John C. Klinck, was host to the 27th Fire Department Instructors Conference, February 22–25. Chief Klinck and Richard E. Vernor, Manager, Western Actuarial Bureau, Chicago, Illinois, and Chairman, NFPA Board of Directors, are perennial co-chairman to this annual fire service assembly. This year 1,782 fire chiefs, fire department instructors, and other fire service members participated in the Conference.

More than 100 speakers appeared on the 4-day program, including Chief Engineer Horatio Bond, Flammable Liquids Engineer Miles E. Woodworth, and Editor of FIREMEN, Warren Y. Kimball, all of the NFPA Staff.

There were a variety of addresses and discussions of timely interest to the fire service and a number of spectacular demonstrations. These showed the use of "wet" water foam on a flammable liquids fire; use of the same mixture as protection against exposure fires; and new training evolutions with 1½-in. hose, directed by Joseph I. Fetters of the University of Missouri, (Chairman of the NFPA Committee on Firemen's Training), and Warren Kimball.

The most spectacular demonstrations occurred when the Conference audience was moved in buses and cars to a section of the city to watch the burning of three frame residences. Some of the action is shown in the pictures below. Operations were planned and directed by Emmett T. Cox of the Western Actuarial Bureau (Chairman of the Exploratory Committee on Water Fog) and Joseph Fetters. Photos shown were taken by Warren Kimball. It should be stressed that the procedures were planned to show controlled burning of buildings, using water fog. No attempt was made to extinguish the fires. It was the consensus of fire chiefs present that Memphis fire fighters who handled the lines could have made short work of extinguishment if permitted. Instead, the buildings were allowed to burn completely after 1½-in. fog nozzles on hand lines first checked the interior fires; then burning was allowed to resume while large caliber fog nozzles did an effective job of protecting exposures.

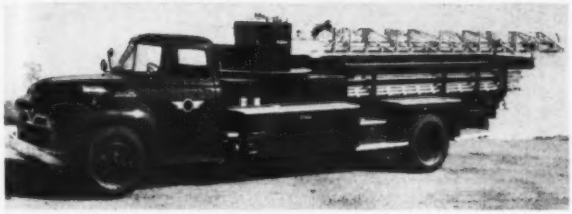
Pattern of master fog stream shown against fire which was permitted to destroy small frame dwelling. Purpose of the test was to demonstrate control rather than extinguishment with fog streams.

The two streams at ground level were from J200 Elkhart fog nozzles attached to Stream Master pipe holders built by the Memphis Fire Department and each supplied by two 2½-in. lines.

Ladder pipe and manually directed fog stream controlled burning of large abandoned building, held down embers and protected cyclone fence adjacent to structure.

Chief Joseph I. Fetters, University of Missouri Fire Training Director, directs attack on fires involving two small frame dwellings. Hand lines with 1½-in. fog nozzles were used during FDIC demonstration.

## New Aerial for Small Departments



Seagrave Corporation of Columbus, Ohio, has announced a new 65-ft . fully hydraulic aerial ladder, designed for small cities and towns unable to finance expensive custom-built aerial trucks. Through use of standard commercial truck chassis and economies of mass manufacture, the truck is available at relatively low cost. It is designed to meet the exacting requirements of NFPA-IAFC-NBFU Standard No. 19. The hoisting cylinder is the same as that used with Seagrave 85- and 100-ft. aerial ladders. The hydraulic pump is driven by a power take-off. The ladders will support a load of 400 lbs. at 45 degrees when fully extended and unsupported. When hoisted at 70 degrees and supported it will safely carry ten or more men evenly distributed. When this truck serves as a water tower with a Seagrave ladder pipe, a 1¾-in. tip at 80 lbs. nozzle pressure may be used, with the ladder fully extended at an angle of between 70 and 80 degrees. Either of two standard Seagrave booster pumps may be provided along with a 150-gallon water tank. Three banks of ground ladders are carried with the longest possible ladder being a 3-section, 50-ft. extension.

## Maryland Fire Service Benefit Show

IN BALTIMORE County, Maryland, recently two volunteer fire fighters lost their lives during a fire; in the City of Baltimore in February, the collapse of a fire-involved building took the lives of a Battalion Chief and five other members of the Department. Just prior to these tragedies, one of Maryland's volunteer fire companies had its station totally destroyed by fire.

Because of these incidents, the Maryland Fire Chiefs' Association is launching a benefit campaign for the widows and children of the fire fighters, and for the volunteer fire company. Climaxing the campaign will be a special show in Baltimore's Memorial Stadium on Sunday, May 1, which will feature the renowned Mummers' String Bands of Philadelphia. Tickets are priced at $2.00 each and are available to anyone wishing to support the campaign.

Further information may be obtained from Chief John A. Purkey, General Chairman, Maryland Fire Chiefs' Association, Inc., Guilford Avenue and 21st Street, Baltimore 18, Maryland.

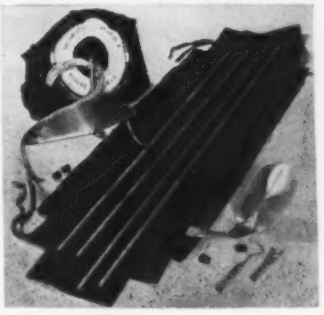
**New Pumper for Lexington**

The Lexington, Massachusetts, Fire Department headed by Chief Roy E. Cook recently acquired this Mack 1,000 gpm pumper. It has a 300-gallon water tank, two booster reels with fog nozzles, rear discharge outlets, foam extinguishers, compartments for gas masks and equipment and a two-way radio.

## New Jersey Training

ACCORDING to *Siren*, publication of the New York State Fire Mobilization and Control, the New Jersey State Firemen's Advisory Council is requesting legislation to establish a Division of Fire at the state level. The Council was organized in 1953 (See FIREMEN for December 1953). Chief Thomas J. Maloney of Jersey City (NFPA member) is heading a legislative committee in this activity.

Another organization, the New Jersey and New York Volunteer Firemen's Association, has adopted the present plans and other training materials of the basic, intermediate and advanced courses in the New York State fire training program.

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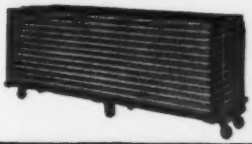

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*Things to Consider in*

# *Aircraft Crash Fires*

THE variety of fire problems which can occur in aircraft crash fires should be subject to discussion in many fire department training sessions. Successful combat of these fires calls for smooth coordination of the fire fighting team, an appreciation of fire behavior and the possibility of explosions. Of importance, certainly, are those simple fundamentals of fire department operation which sometimes mean the difference between a routine job or unnecessary confusion. Several recent incidents of plane crashes highlight some of these.

### Whose the "Responsible" Person?

In St. Petersburg, Florida, on January 10, a Lockheed Lodestar twin-engine transport ground looped, turned 180 degrees, and started to burn when the landing gear collapsed and punctured the wing fuel tank. Safe evacuation was made by 10 passengers and 3 crew members. An airport fire brigade responded to the crash alarm in their crash truck within two minutes. Heat barred close approach and two 36-pound dry chemical extinguishers and 250 gallons of premixed foam were used without effect.

A telephone call brought 3 tank wagons and one pumper of the St. Petersburg Fire Department before 8 minutes had passed. When they arrived, an Airport employee told them to "let the plane burn" since all persons had escaped and the fire was quite advanced. The City equipment returned to quarters.

About twenty minutes later the nearby Coast Guard Air Station received a call for help and dispatched their Howe 1,100-gallon crash truck. Enroute, police stopped this truck and told the crew that the tower at the Airport had advised that the fire was out. This truck returned to quarters only to be called again twenty minutes later. This time extinguishment was made with 1000 gallons of 10 percent foam solution. Mail, luggage and personal effects of passengers were destroyed, as well as the aircraft.

In Preston, Connecticut, last year when the Air France plane crashed (see January 1955 NFPA *Quarterly*, page 307) volunteer fire fighters were suddenly called from their combat by a "responsible" person without the knowledge of Chief Henry Kaufman of Voluntown, who was in command of the fire fighting. However, a few moments later when the Chief traced the order, he found that while the order did have authority, no one had bothered to ask for the credentials of the responsible person, who was in civilian clothes and might have been just another bystander. The Chief resumed the fire fighting task and saved thousands of dollars worth of cargo and mail.

### Where Can They Happen?

Modern fire departments are aware that aircraft crashes can happen in or near any community. It is advisable, of course, for training programs to include some instruction on the types of aircraft which generally pass over the vicinity. Fire fighters should be familiar with the design and structure of such planes, particularly with the location of fuel tanks and sections where rescue can be made. Sometimes emergency may bring unexpected responsibility.

**Although good apparatus and well-trained fire fighters were available, indecision was a factor in preventing attack on this Lodestar transport plane in St. Petersburg, Florida. As a result mail, property of passengers and the plane were destroyed before extinguishment was made. (*Wide World Photo.*)**

For example, on February 8, a B-36 bomber burned on the runway of Carswell Air Force Base near Fort Worth, Texas. Two of the crew members died and 18 others were injured or burned. This accident blocked the Carswell runway and as a result eight B-36's were detoured to the nearby civilian Carter Field. This incident caused the airport director to call in extra fire fighters as a precautionary measure and protection against the extra fire hazards occasioned by these landings of one of the world's largest bombers.

Another example of such emergency occurred when a C-119 transport plane developed an engine fire near Miles City, Montana, on January 11. The installed carbon dioxide fire extinguishing system failed to totally extinguish the fire. Thirty-two soldiers parachuted from the plane but five crew members remained to bring the crippled aircraft to a successful landing at the Miles City Airport. The Miles City Fire Department responded to a telephone call and effectively extinguished the remaining engine fire with carbon dioxide and dry chemical extinguishers.

### Watch Those Rockets

As recommended in NFPA No. 406 "Aircraft Rescue and Fire Fighting Techniques for Municipal and Rural Fire Departments" (price 35c per copy), the proper fire fighting approach to a burning aircraft is along the fuselage from the most advantageous direction, preferably from the windward side. However, many military aircraft have mounted rockets and other ammunition which may or may not discharge upon impact. If rescue or other approach to the plane is necessary, fire fighters should try to "move in" from the sides of the plane, since exploding rockets are more apt to discharge

towards the front or rear of the fuselage.

Near Dakota City, Iowa, on January 22, a severe inflight explosion in the aft section of a F-86D fighter plane resulted in a crash in a willow swamp about a mile outside the city. Miraculously the pilot escaped, despite severe injuries. Fire was instantaneous, since the fuel tanks ruptured and about 800 gallons of gasoline were involved in flames. The crash site was inaccessible for fire trucks. The pilot was removed from the danger area by the Dakota City fire fighters but eight rockets had detonated and 15 others were located and destroyed by the demolition crews.

In Norwell, Massachusetts, last December, a rocket-equipped F-84 fighter crashed and exploded with a small fire resulting in a wooded area. Members of the fire department, headed by Chief Richard A. Gaudette, took positions at some distance from the "sides" of the plane but did not make any approach. Since the fire was small and easy to extinguish, other fire fighters posted themselves about one mile from the site at all roads leading into the vicinity. They controlled traffic and "sight-seers" and allowed only authorized personnel to enter. The department was commended by the U. S. Air Force for these actions.

In military plane crashes the primary reason for not allowing unauthorized persons to enter a crash area or to touch any plane parts is to permit military authorities to have all possible evidence which will help determine the cause of the crash. Where rockets or other explosives are involved, as in the Norwell situation, the military have sufficient records to determine which portions of such planes are unaccounted for. Such detailed information should serve to prevent ammunition or explosives from being left in the area only to explode later.


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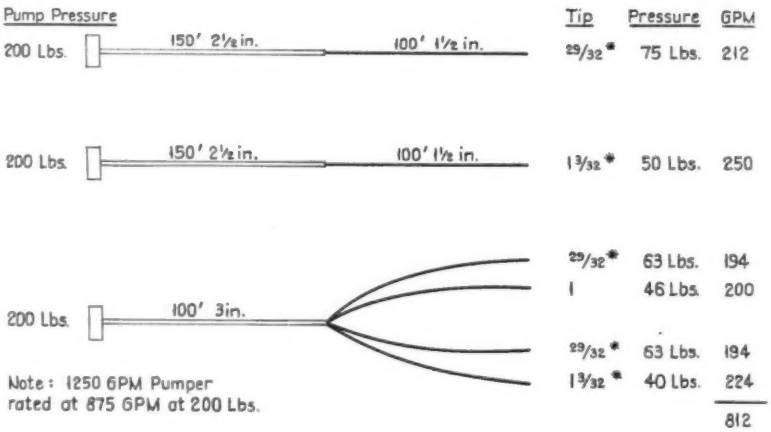
*Using 1½-Inch Leader Lines to*

# Maximum Capacity

FOR some time there has been a growing awareness in fire department circles that 1½-in. fire hose is not being used to its potential capacity when employed as leader lines supplied by fire department pumpers. Originally, 1½-in. hose was thought of as small volume hose which would supply approximately 50 gpm through a ½-in. tip, or a small capacity fog nozzle. More recently, a number of city fire departments have provided 100 gpm fog nozzles for their pre-connected 1½-in. leader lines from pumpers. The 100 gpm flow caused approximately 27–30 pounds friction loss per 100 ft. of hose.

To call attention to the potential carrying capacity of 1½-in. hose Chairman Joseph I. Fetters of the NFPA Committee on Firemen's Training, and Warren Y. Kimball of NFPA FIREMEN magazine, assisted by the Memphis Fire Department, demonstrated to the 27th Annual Fire Department Instructors' Conference on February 23, that with certain layouts 1½-in. leader lines could handle flows of 200 gpm, and could provide flexibility and mobility at the end of 2½-in. pumper lines. The layouts shown at upper right were used.



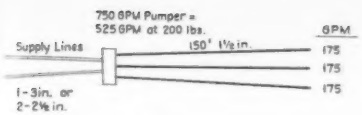

* Flow rated nozzle tips designed to give 175 GPM and 250 GPM at 50 Lbs. nozzle pressure

Standard 2½-in. nozzles were employed having 1½-in. National Standard thread at the valve as called for in NFPA Standard 194B. This is important as many 1½-in. nozzle valves have very small waterways which cannot handle the full flow of 1½-in. hose and cause unnecessarily high pressure losses. Unfortunately, many old 2½-in. nozzles are in use which do not have standard threads at the valve and cannot be used for 1½-in. hose without use of adapters. Tips used at the FDIC varied from 29/32-in. to 1 3/32-in. as shown in the diagrams. These were flow rated tips previously described in FIREMEN and were furnished through the courtesy of the Akron Brass Manufacturing Company, Wooster, Ohio.

For convenience in taking pitot gage readings the demonstrations made use of solid stream tips at conventional nozzle pressures. If fog nozzles were to be used an additional 50 lbs. pump pressure would be required, or flow should be reduced to about 150 gpm for the same layout. It should be remembered that higher flows and pressures make lines somewhat more difficult to handle and even with 1½-in. hose, large flows require at least two men at the pipe.

As a result of these demonstrations, a number of fire departments are planning their own experiments with increased flows through 1½-in. hose. Several 2½-in. fog nozzles can discharge volumes in the 125 to 175 gpm range at 100 lbs. nozzle pressure and would be suitable for use on short 1½-in. pumper lines. Class A 750 gpm pumpers are rated to discharge 525 gpm at 200 lbs. This is equivalent to three 175 gpm streams. With 150-ft. lines 175 gpm is practical, using 1½-in. pumper lines. With 125 to 150 gpm flows, 1½-in. lines up to 250 ft. long should be possible. A suggested layout is shown at top of the next page.

**Memphis fire fighters operate four lines of 1½-in. hose supplied by one 3-in. line and discharging over 800 gpm as shown in diagram at upper right. Note in picture at right that two men are handling each line to assure control because of strong nozzle pressure.**




AS POINTED out in FIREMEN for January, 1955, friction loss tables for 1½-in. hose have been extremely conservative. For practical fire ground use the following round figures, although not exact, are suggested as reasonably accurate and easy to use as a rule of thumb.

| GPM | FL per 100 Ft. |
|---|---|
| 50 | 10 |
| 75 | 20 |
| 100 | 30 |
| 125 | 40 |
| 150 | 50 |
| 175 | 75 |
| 200 | 100 |

More exact figures are usually meaningless because where pressure losses in hose are less than anticipated the nozzle pressure and flow will increase slightly and will result in additional friction loss. Where pressure losses in hose are greater than expected, the nozzle pressure and flow will decrease causing a drop in friction loss. The important consideration in delivering large flows through small lines is to accept high friction losses in short lines and keep pump pressures high, preferably in the 200–225-lb. range.

It should not be necessary to point out to experienced fire fighters the great striking power that may be obtained by using 125 to 175 gpm leader lines with 1½-in. hose. This also should aid greatly in water conservation by blacking out fires in a fraction of the time required when attacking with streams having less range and volume.

## Air Raid Signals

A RECENT order of the Federal Civil Defense Administration has changed the procedures for air raid signals throughout the nation. Henceforth, an "alert" will be given by a three to five minutes blast or sirens and a rising and falling tone or short blasts for three minutes will be the signal "to take cover." At the present time the "all clear" signal has been abandoned because of the uncertainty of the scope and direction of fallout radio active particles resulting from blasts of atomic weapons.


SOMETHING NEW HAS BEEN ADDED . . .

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"A-Z"

FIRE HOSE WASHER

- Washes and Drains in One Operation
- Cleans Thoroughly — With or Without Detergent
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*Write for New Folder*

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The patented electrically operated Circul-Air hose dryer circulates prewarmed fresh air through loosely coiled hose at the rate of 5 to 6 air changes per minute. Saves floor space, hard work and lengthens hose life!

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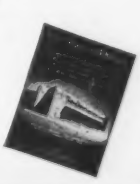
*If you are planning to build, or remodel, send for our new brochure "FIRE STATION DESIGN."*



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Superior quality, advanced design, exclusive fabric materials and safety features have made Midwestern a leader in the field of firemen's safety clothing. For complete information on our full line, see your Midwestern dealer. A letter to the factory will also bring you literature and material samples for your inspection.

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Specify HALE

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- Sold thru Mfrs. of Quality Apparatus

**VALUABLE TIME SAVED:** While we have always emphasized *Reliability* of priming rather than Speed of priming, we cannot help taking pride in the results obtained in the test shown in this picture. PRIMING TIME (Water out the Nozzle) WAS BETTER THAN 18 SECONDS FOR THIS HALE QL PUMP ON A 22-FOOT LIFT! This was done at reasonable Engine speed in both series and parallel.

Minimum specifications require priming on a 10-foot lift in 30 seconds. A substantial reserve on all HALE products is a consistent HALE policy.

*Send today for QL Bulletin 334. HALE pumps are built in all standard capacities.*

HALE FIRE PUMP CO. Conshohocken, Pa.


## Experimental Fires

AT A meeting of the Exploratory Committee for Application of Water Fog, held in Memphis, Tennessee, on February 20, Ohio State Fire Marshal Charles Scott and Engineer Stanley Thompson, of the Ohio Inspection Bureau, reported on 15 experimental fires conducted in that state for the purpose of instructing fire fighters in water fog techniques. (The Exploratory Committee is headed by Emmett T. Cox, Field Officer of the Western Actuarial Bureau in Chicago.)

The following directions and procedures for setting up fire tests have been followed in the State of Ohio and are published here for the guidance of fire departments which may be planning similar training exercises:

**Directions for Setting Up a Fire Test**

1. Obtain written permission from the owner to burn the building.
2. Make sure that all insurance on the building has been cancelled.
3. Make a rough drawing of the building showing room dimensions. Send a copy of the drawing along with the names of any participating departments to the State Fire Marshal. (This will help the State Fire Marshal set up a working schedule for your tests.)
4. All utilities should be disconnected.
5. Leave doors, windows and roof intact. A much better test can be held if this is done.
6. The building should be loaded with used furniture, scrap paper, wood and excelsior. Recommended loading should be from 6 to 10 pounds of material per each square foot of floor area. This loading is necessary to obtain a fair test and to facilitate the starting of the fires.
7. For the average dwelling, you will need at least two pieces of fire equipment to carry out the test. Enough men will be needed to man two 1½-in. lines and one 1-in. booster line. If there are exposures present, additional equipment and men to cover them, will be necessary.
8. Make certain that there is adequate water available for carrying out the tests and for protecting exposures.
9. Notify the local law enforcement agency of the test so they may have sufficient help present to control the crowds and traffic.

10. Have your ladies auxiliary or some other group set up a lunch stand serving sandwiches and coffee. This is an opportune time to make a little extra money and the refreshments are quite welcome.

11. The average test and burn-down takes from 3 to 4 hours, so set your starting time accordingly.

12. Notify neighboring departments that are not participating in the tests. They can learn a lot by observing.

13. Take liability insurance for day of fire.

### Garden for Firemen

1. Plant five rows of peas
   - Presence . . . Be an active member
   - Promptness . . . Be on time
   - Persistence . . . So what, let's try some other way
   - Purpose . . . March toward a worthy goal ahead
   - Praise . . . It is not important who gets the praise
2. Plant four rows of lettuce
   - Let us be faithful
   - Let us be true to our obligations
   - Let us be governed by truth and loyalty
   - Let us be friends, one to another
3. Plant three hills of squash
   - 1) the vest button type — (always poppin' off)
   - 2) the vacuum cleaner type — (always pickin' up dirt)
   - 3) the liniment type — (always rubbin' it in)
   - Squash indifference
   - Squash unconstructive criticism
4. Plant five rows of turnips
   - Turn up at every meeting
   - Turn up with a smile
   - Turn up with enthusiasm
   - Turn up with a determination to be constructive
   - Turn up with a sympathetic attitude

*(From an address by Emmett Cox, Western Actuarial Bureau, Chicago, Illinois.)*


**Individual Fireman's Responsibility in Public Relations**

**6 x 9 inches, 22 pages**
**35 cents per copy**

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**it's made with DACRON!** The new, stronger, synthetic fibre load-carrying "filling" cord.

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**it's 50% STRONGER!** 600 & 400 lb. test . . . withstands 50% more pressure than any hose of the same diameter.

For *faster* fire fighting action, get Fyr-Fyter's new Super Fyr-Flex . . . the fire hose that now outmodes conventional hose! Its exceptional strength without bulk, made possible with Dacron reinforcing "filling" cord, plus its lightness and flexibility, gives you top performance efficiency. And for longer life and economy, Super Fyr-Flex provides a new high in resistance to heat, chemicals, water absorption, mildew, abrasion, and wear. Plan now to take advantage of the performance extras you get in Super Fyr-Flex fire hose . . . write for complete information today!

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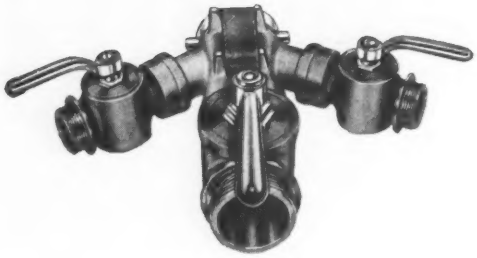

Plate 240

2½" quarter-turn valve on straight-way connection and 1½" quarter-turn valve on sensible lug swivel. Rough body, painted red, with polished bronze or chromium plated trim. Leather carrying strap.

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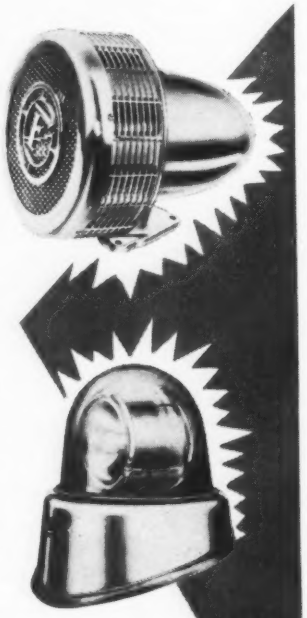

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## Going to a Fire School?

**Alabama:** The Alabama State Fire School will be held at Tuscaloose, May 30–June 2. Write to M. O. Hulsey, Public Service Training, Box 1475, University of Alabama.

**Arizona:** The Arizona State Fire School will be held at Phoenix Technical School, October 20–22. Write to Harry C. Bigglestone, District Engineer, Board of Fire Underwriters of the Pacific, 405 Luhrs Building, Phoenix.

**Arkansas:** The Arkansas State Fire School will be held at Little Rock, Arkansas, July 11–14. Write to J. C Ruppert, State Supervisor, Trades and Industrial Education, 18th and Spring St., Little Rock.

**California:** A Fire Service Instructors' Conference will be held in Fresno, May 23–27. A Fire and Arson Investigation Short Course will be held at the University of California, Berkeley, June 20–24. Write to Thomas S. Ward, Director, Fire Training Program and Extension Division, University of California, Berkeley.

**Colorado:** The 1955 Convention of the Colorado State Firemen's Association will be held at Estes Park, June 8–11. Write to Secretary Arthur J. Becker, 4250 Stuart St., Denver 12, Colorado.

**Connecticut:** The Annual Fire College will be held at the New Haven Fire Department Training Grounds, June 6–10. Write to L. W. Eddy, Supervisor, Service Training, State Department of Education, Box 2219, Hartford.

**Delaware:** The 7th Annual Short Course for Firemen will be held in Camden and Wyoming, July 16–17 and July 23–24 respectively. Write to Frank M. Forstburg, Delaware State Board for Vocational Education, 511 West 8th Street, Wilmington.

**Florida:** Two sessions of the Florida State Fire College will be held May 23-June 24 and July 23–24. Write to W. H. Barnett, Superintendant, Florida State Fire College, P. O. Box 785, Ocala.

**Georgia:** Officer and basic training courses are scheduled to be held at the Georgia State Fire College in Atlanta, May 9–10. An Instructors' Course will be held June 6–7, and an Arson Investigators' Course will be held July 11–12. Write to Harry Phillips, Director, Vocational Service, State Department of Education, 642 Killian Street, Atlanta.

**Illinois:** The Illinois State Fire School will be held at Champaign, June 13–17. Write to George W. Harper, Director, Illinois Fire College, University of Illinois, Urbana, Illinois.

**Iowa:** The 31st Annual State Fire School will be held at Iowa State College in Ames, May 24–27. The 9th Annual Fire Inspectors' School will be held at the College August 2–5. Write to Mark

Brosier, Supervisor, Firemanship Training, 110 Marston Hall, Iowa State College Ames.

**Kentucky:** The Kentucky Fire School will be held at Lexington, June 6–9. Write to J. L. Thompson, Chairman, Kentucky Fire School Committee, 940 Starks Building, Louisville 2, Kentucky.

**Maryland:** The 4th Annual Fire Inspectors Short Course will be held at the University of Maryland, April 5–8. The NFPA Inspection Manual will be used as a text. Meetings will be held in the Fire Service Extension Building on the campus. Write to Robert C. Byrus, Director, Fire Service Extension, University of Maryland, College Park, Maryland.

**Michigan:** The Michigan State Fire School will be held at Ann Arbor, June 13–17. Write to M. D. Whale, Supervisor of Public Service Training, Office of Vocational Education, P. O. Box 928, Lansing, Michigan.

**Minnesota:** The 1955 Minnesota Fire School will be held at the University of Minnesota's Institute of Agriculture, St. Paul, April 25–29. For further information write to Dr. J. O. Christianson at the Institute, or to Leonard C. Lund, Deputy Commissioner, Fire Marshal Department, St. Paul, Minnesota.

**Nebraska:** The Nebraska State Fire School will be held April 17–19 at Grand Island. Write to Howard Gorham, State Supervisor, Trade and Industrial Education, State Capitol Building, Lincoln, Nebraska.

**North Carolina:** One session of the Fire College and Pump School is scheduled to be held May 23–26. Write to Chief Charles L. Burkett, Salisbury Fire Department, Salisbury.

**Ohio:** Annual Conference of the Central Western Firemen's Association of Ohio will be held at Eaton, June 22.

The Ohio State Fire School will be held at Columbus, September 12–16. Write to Robert M. Reese, Supervisor, Trade & Industrial Education Service, Department of Education, 220 S. Parsons Ave., Columbus, Ohio.

**Oklahoma:** The Oklahoma Fire School at Stillwater will hold its annual session on April 26–30. Write to George Orgain, Fire Service Instructor, Trade and Industrial Dept., Oklahoma A & M College, Stillwater.

**Saskatchewan:** The Fifth Annual Conference of the Saskatchewan Association of Fire Chiefs will be held at Weyburn, June 23 and 24. Write to Chief G. M. Beach, Fire Department, City of Weyburn, Saskatchewan.

**Wisconsin:** The State Fire School at Madison will be held on August 15–17. Contact H. C. Thayer, Chief, Trade and Industrial Education, State Board of Vocational and Adult Education, Madison.

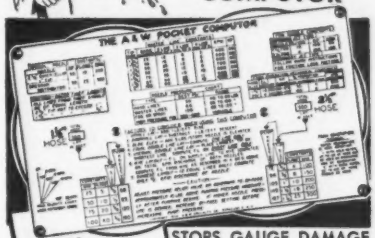
## "Caveat Emptor"

THE NAME of NFPA is being used without permission as part of a sales campaign in a section of New York City. A member of the Association recently reported that representatives of a firm selling fire alarm systems had called his home and asked for an appointment. They professed to be "lecturers" for the NFPA, and not just salesmen, but after a lengthy showing of fire pictures they then attempted to sell a home fire alarm system.

Readers of FIREMEN are asked to be alert to such misrepresentation. The NFPA does not have "lecturers" or representatives attempting to sell any product to anyone, nor does the Association "approve" any fire equipment or other product.

## Correction Notice

Readers may have noticed on page 36 of last month's issue the statement "Thus dividing 250 by 25 we get the loss per 1,000 feet of hose, which is 10 lbs". The length of hose should of course, have been stated as 100 feet, instead of 1,000.

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PREVENTS RUPTURED HOSE

If you *gamble* with hose pressure you might as well organize a bucket brigade! Don't risk it! The A&W Pocket Computor completely calculates all 1½" and 2½" single, double, equal and unequal double lays, Y's and Siamese lays up to 1500'. Exactly locates every pumper in relays up to 7000' and indicates their pressures. Constant charts for 1½" or 2½" lays, master lines, fog and special nozzles, foam formulas, conversion factors, cautions plus other useful pumping information. Weather-proof vinyl plastic.

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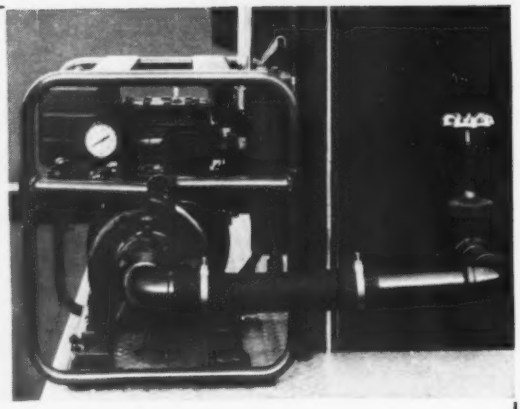
**HALE**

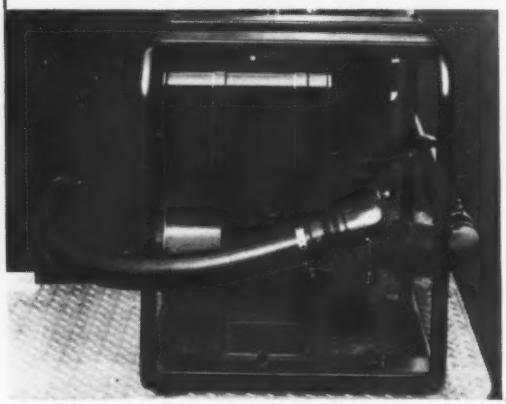
**TYPE FZZ**

**Portable Unit**

**Installed on Running Board of Apparatus**

Picture at right shows Hale FZZ portable pumping unit (from Suction Side) neatly installed on running board of pumper. Shut-off valve at right leading from Booster tank.





Below, view of FZZ from Discharge Side showing Discharge running into Booster line.

Pump can be easily detached to fight fire direct; as standby pump; or to supply larger pumper from source of water inaccessible to the pumper.

The FZZ will supply from draft 2 capable fire streams thru 1½" lines. Performance substantially exceeds NBFU and NFPA cap. and pressure requirements.

*Write for FZZ folder today. Ask for Demonstration.*

**HALE FIRE PUMP CO.** Conshohocken, Pa.

*Fire Pumps in all Standard Capacities*



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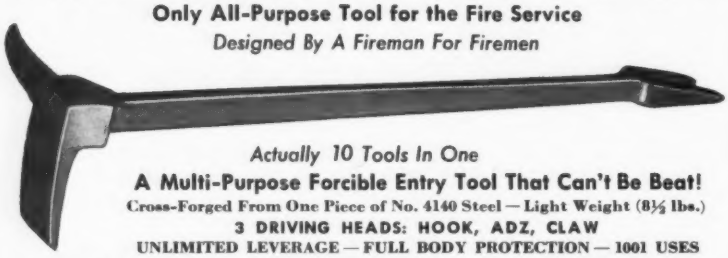
*Designed By A Fireman For Firemen*



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### Instructor's Manual

THE Trade and Industrial Education Service of Ohio State University has published a "Fire Service Training Instructor's Manual" as the last text in the Fire Service Training Series. Previously published books in this series were "Fire Service Training" and the "Learner's Workbook."

This manual deals with group instruction methods. Each lesson plan describes the desired results of the lesson, materials, equipment and supplies needed, and sources for reference. Instruction procedure is divided into: introducing the lesson; presenting the lesson; application; and checking and follow-up.

A section on class organization and teaching techniques is included, together with answers for questions contained in the "Learner's Workbook."

Price of the "Instructor's Manual" is $3.50 per copy, plus postage. For copies or further information write to The Instructional Materials Laboratory, 200 Communications Laboratory, The Ohio State University, Columbus 10, Ohio.

### Arson School in Louisiana

THE fourth annual Arson and Fire Prevention Conference will be held under the direction of Louisiana State Fire Marshal Sidney S. Bowman, at the Roosevelt Hotel in New Orleans, July 12–15. The Conference is open to all interested persons and there is no registration charge. Further information may be obtained by writing to Fire Marshal Bowman, 110 New Court House Building, New Orleans, Louisiana.

### Industrial Fire School

ANSUL CHEMICAL COMPANY, Marinette, Wisconsin, has scheduled twelve 3-day classes of instruction in industrial fire fighting for the spring and summer of 1955. The first class will be May 23–25 and the final class September 19–21. Courses are open to industrial plant safety personnel, municipal and military fire fighters and other interested personnel. Registration is limited to 25 persons per class. For further information write to Director, Fire School, Ansul Chemical Company, Marinette, Wisconsin.

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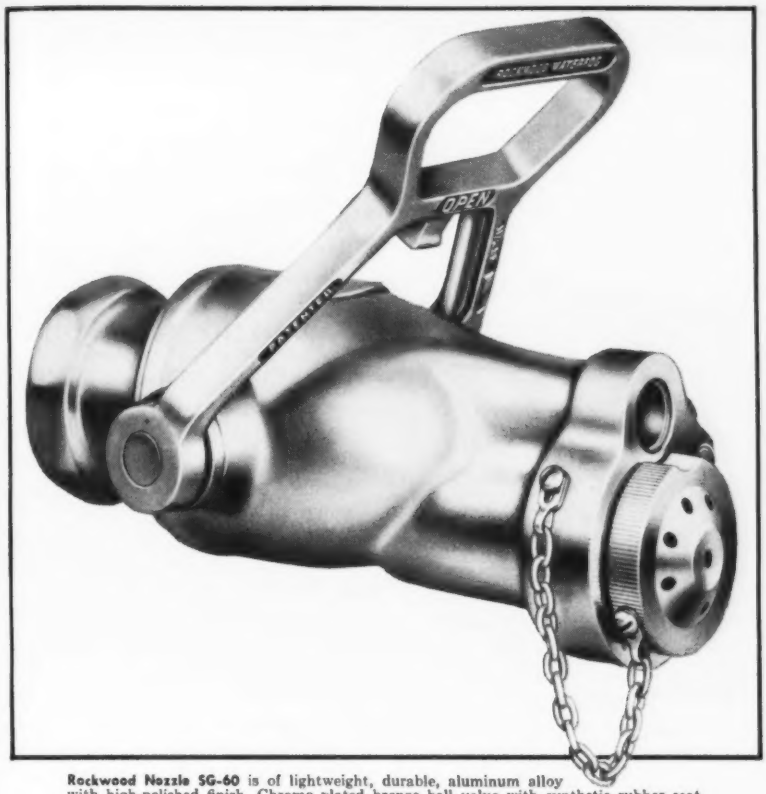


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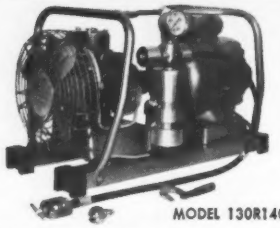

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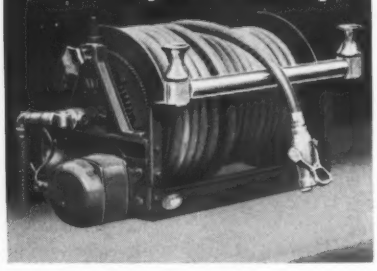

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# MAKING A GOOD JOB OF IT

BY WARREN Y. KIMBALL

## Relays for Volume

IN EMERGENCIES connected with Civil Defense, it must be assumed that interruptions of water supplies can occur. Water may have to be taken from static sources and moved for distances greater than normally handled by a single pump. This means that relay operations will be essential. (Basic calculations for effective relay operations are given in the NFPA book "Operating Fire Department Pumpers.")

Relay operations with a single line of 2½-in. hose (as used at rural fires), permit maximum distances between pumpers, but because of the limited capacity of this size of hose, the amount of water moved is relatively small considering the total capacity of the pumpers employed. Also with a single line, the entire relay is cut off with the failure of any single section of hose in the layout.

With pumps 1,000 ft. apart, and supplying dual 2½-in. lines at 200–225 lbs., approximately 600 gpm can be relayed provided that the last pumper is not over 500 ft. from the nozzle. The last pump must provide nozzle pressure. This type of relay has been tested up to 3400 ft. using four 1,000 gpm pumps as in Figure 1.

With 750 gpm pumps the total flow would be approximately 525 gpm if the pumps are not to exceed their rated capacities at 200 lbs. On the fireground there is little opportunity to assign pumps to special positions in a relay. Time and order of arrival are the chief factors in a fast and successful operation.

Once water is started it is desirable to maintain steady discharge because pressure surges in long lines may exceed the ability of pressure governors and cause hose to burst. A good plan is to have a spare blow-off line in operation whenever the nozzles are closed. Some departments provide a special pressure relief device in the line at the pump nearest to the fire. It is probable that under emergency conditions the supply engine will be drafting

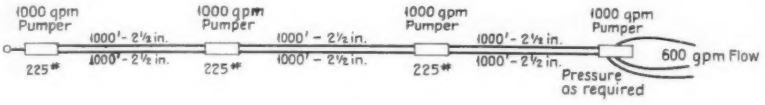


Fig. 1. Supplying dual 2½-in. lines with 1000 gpm pumpers allows a good flow of 600 gpm through this 3,000-ft. relay.

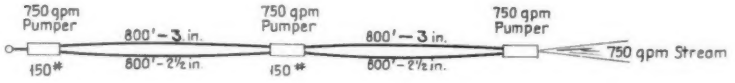


Fig. 2. Combining 2½- and 3-in. lines permits full capacity relay with 750 gpm pumpers.

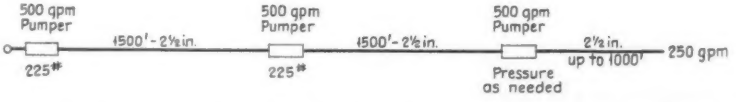


Fig. 3. Single 2½-in. line, while of limited capacity, can be used effectively in a relay if only small volumes of water are required.

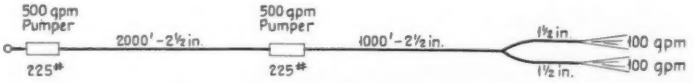


Fig. 4. Using 1½-in. lines wyed from a 2½-in. line provides approximately 200 gpm for fire fighting.

water, although it may be taking suction from a hydrant not affected by supply failure in the fire area.

A good plan is to set the supply engine immediately at the source of water without wasting time for laying hose. Hose should be laid by other companies in this type of relay as dual lines will be needed.

The water at the fire may be used as best fits the situation, *i.e.*, two 2½-in. lines; one 2½-in. and two 1½-in. lines; a heavy stream; etc.

When using 750 gpm Class A pumpers similar to those provided under U. S. Civil Defense matching funds, it is possible to move approximately 750 gpm if the proper hose layout and pump spacing is employed. At least two lines of hose would be required and to get full capacity at least one line should be 3-in. hose, or three lines will be needed between pumpers to keep down the friction loss so that the pumps may operate in parallel or volume position. (For discussion of flow in supply lines, see March, 1955, FIREMEN — Ed.)

The laying of the lines will be facilitated if the pumpers have divided hose bodies carrying the two sizes of hose (2½-in. and 3-in.) in separate compartments. With the layout as shown in Figure 2, with pumps operating at 150 lbs. in parallel, approximately 750 gpm will be moved if pumps are 750 to 800 ft. apart on level ground. About 675 gpm will be moved if pumps are 1000 ft. apart.

However, in a practical operation distance between pumps should be limited to the hose carried in the divided hose bodies. Thus the pumpers might be only 600 ft. apart so that when operating at rated capacity at 150 lbs. there would be substantial residual pressure on the incoming gage as is desirable.

#### Review of Low Capacity Relays

As mentioned before, where a single line small volume relay is employed, pumpers can be operated in series with 225 lbs. discharge pressure. This will permit any size of Class A pumper to move approximately 250 gpm through 2½-in. hose with pumps 1500 ft. apart, or better than 200 gpm with pumps 2,000 ft. apart. Thus if relatively small flows will suffice, water can be moved relatively long distances with few pumpers.

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## Membership Report

THIS year a number of State fire schools have requested lists of NFPA publications of special interest to fire fighters. These lists are to be distributed to inform the students of authoritative publications which can be used to supplement the training courses of the fire schools. Limited quantities of such lists still may be obtained without charge by any fire department, fire school or association which has membership in NFPA.

### *NFPA Welcomes:*

The following fire chiefs, fire departments and industrial fire brigades which have recently joined the Association.

**Arkansas:** Chief Jim Belue, Earle Fire Department, Earle.

**California:** Chief Jerry D. Bennett, Arroyo Grande Fire Department, Arroyo Grande; Chief A. H. Pendleton, Barstow Fire District, Barstow; Chief Art Wagner, Chino Fire Department, Chino; Chief Ernest Filippi, Hanford Fire Department, Hanford; San Leandro Fire Department, San Leandro; Seal Beach Fire Department, Seal Beach.

**Colorado:** Deer Trail Vol. Fire Department, Deer Trail; Chief Paul Weaver, Columbia Gardens Fire Department, Denver.

**Connecticut:** Chief Thomas J. Hayes, East Haven Fire Department, East Haven; Chromium Corp. of America, Waterbury.

**Illinois:** Chief James H. Ellis, Village of Forest View Fire Department, Berwyn; Elwood Volunteer Fire Department, Elwood; Asst. Chief John R. Bell, Richton Park Volunteer Fire Department, Richton Park.

**Indiana:** Delco Radio Division, General Motors Corp., Kokomo.

**Iowa:** Chief Ray Gates, Marcus Fire Department, Marcus.

**Maryland:** Maryland State Firemen's Assn., Hyattsville.

**New Jersey:** Chief Ray Elser, Fairview Fire Co. No. 1, Paramus.

**Ohio:** Navarre Volunteer (Village) Fire Department, Navarre.

**Oklahoma:** Chief W. T. Loman, Oklahoma Fire Department, Duncan.

**Rhode Island:** Chief James T. Bonn, Sr., Oakland Beach Volunteer Fire Co., Warwick.

**Washington:** King County Fire District No. 43, Maple Valley.

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# What's New in Fire Equipment, Catalogs and Bulletins

### Fire Prevention Booklet for Grocers

A colorful booklet giving grocery store owners information on fire prevention has been prepared by the Scott Paper Company of Chester, Pennsylvania. A representative of the company consulted with the NFPA Staff in preparing the publication. It lists the major causes of store fires and explains how to eliminate hazards. Defective refrigerator equipment, careless use and disposal of matches, improper or frayed wiring, incinerators too close to combustible materials, defects in building heating equipment and improper handling of rubbish are cited as the most common fire causes in these occupancies. There is also a simple quiz sheet for the grocer and a poster to instruct employees what to do if fire occurs. Fire departments can get free copies for stores in their neighborhood by writing to the Public Relations Department, Scott Paper Company, Chester, Pennsylvania.

### Radio Equipment

A new control head and mounting brackets for radio installation has been announced by the Mobile Communications Department, A. B. Du Mont Laboratories, Inc., 1500 Main Avenue, Clifton, N. J. It is designed particularly for under-dashboard installations of single unit mobile radios. The new control head slips over the front of the case containing the transmitter-receiver power supply chassis for either the Type MCA-101-A or MCA-301-A in place of the standard panel. The control board provides interchangeable control panels for single or dual-channel operation and contains the speaker, control panel, power cable connection, antenna connection, right or left receptacles for microphone cable connectors and a microphone holder. Get the Du Mont fire service radio story direct from the manufacturer.

**Pressurized Fire Extinguisher**

A one-hand operated 2½-gallon water or anti-freeze filled fire extinguisher is now being supplied by Stop-Fire, Incorporated, 125 Ashland Place, Brooklyn, New York. Called the "Redi-Jet," it is pressurized with air or nitrogen to 100 pounds per square inch. Discharge is made with operation of a squeeze-grip lever at top of the extinguisher. This lever also serves as the carrying handle and when squeezed causes ejection of the stream for a distance of about 35 ft., according to the manufacturer. A pressure gage indicates when recharging is necessary. Repressurizing may be accomplished with a standard air compressor. The extinguisher has been listed by the Underwriters' Laboratories. Write to manufacturer for Bulletin RJ-255.

### Synthetic Fire Hose

Hamilton Rubber Manufacturing Corporation, Trenton 3, New Jersey, has announced the addition of "Flexrite Fire Hose" to its industrial rubber products. The new hose employs dacron as filler cords in both inner and outer jackets. Flexrite is supplied in 1½-in. and 2½-in. ID double jacket construction designed to withstand 400 pounds test pressure. Samples and literature may be obtained by writing to R. D. Maurer in care of the manufacturer in Trenton

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## INDEX TO ADVERTISERS


| | Page |
|---|---|
| A & W Specialty Company | 25 |
| American District Telegraph Company | 4 |
| American Marsh Pumps, Inc. | 5 |
| Aquatic Equipment Company | 17 |
| Bi-Lateral Fire Hose Company | 31 |
| The Blitz Buggy Company | 25 |
| V. H. Blackinton & Co., Inc. | 19 |
| Cairns & Brother, Inc. | 32 |
| Circul-Air Corporation | 21 |
| The Cornelius Company | 30 |
| W. S. Darley & Company | 33 |
| Federal Sign and Signal Corporation | 24 |
| Fyr-Fyter Company | 23 |
| Gamewell Company | 3 |
| Hale Fire Pump Company | 22, 26 |
| M. A. Halligan | 26 |
| Clifford B. Hannay & Son, Inc. | 30 |
| Mack Mfg. Corporation | 6 |
| Metcalf Brothers & Company | 27 |
| Midwestern Safety Mfg. Company | 22 |
| The Monroe Company | 17 |
| National Flag & Emblem Co. | 34 |
| Powhatan Brass & Iron Works | 24 |
| Radio Apparatus Corporation | 26 |
| Rockwood Sprinkler Company | 29 |
| D. B. Smith & Company | 35 |
| Ward LaFrance Truck Corporation | 2 |



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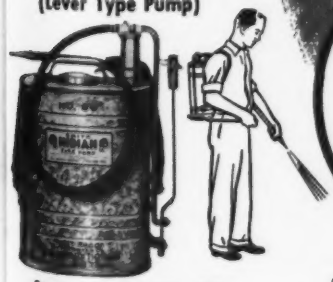

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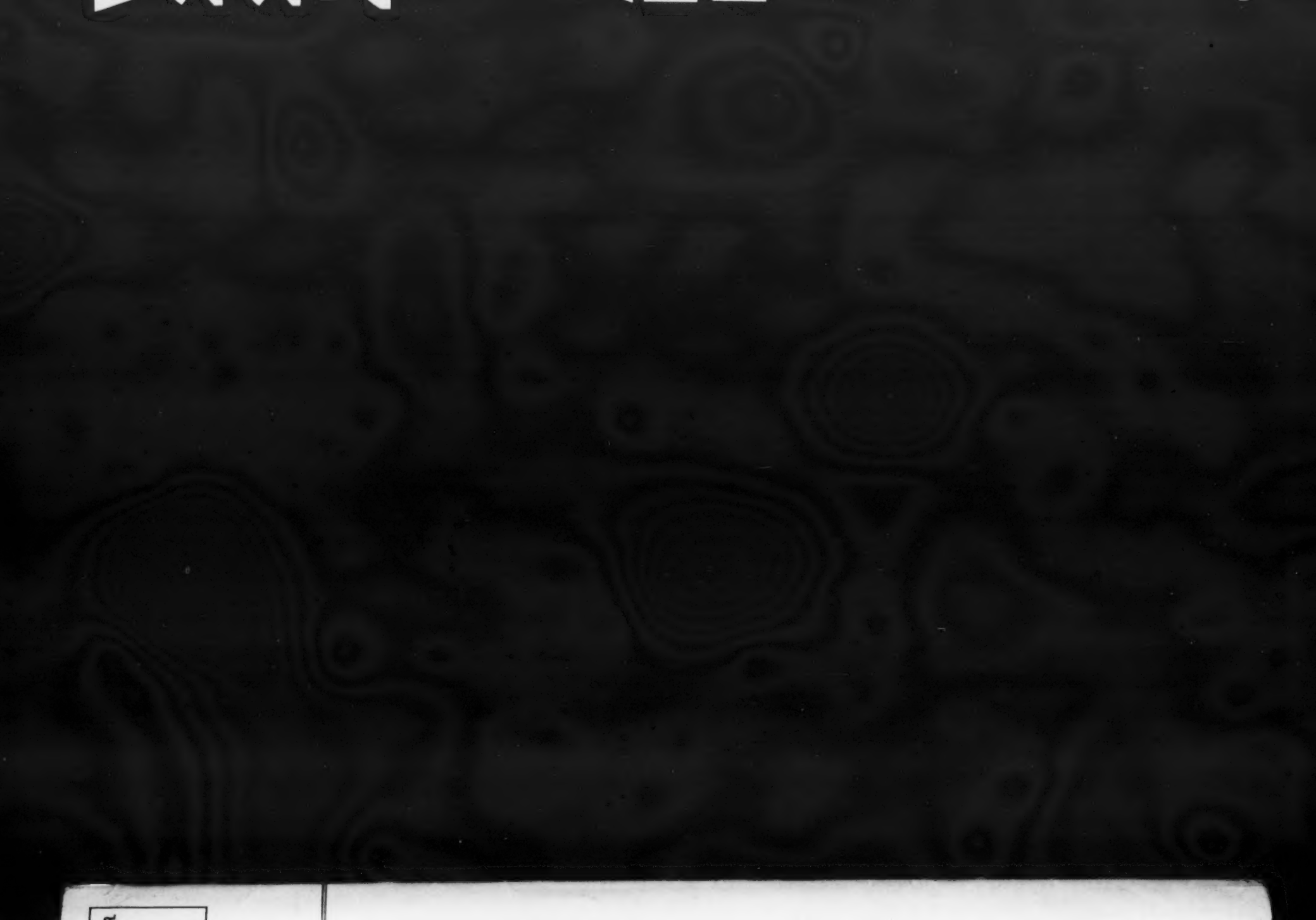
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